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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/726,506	12/04/2003	Eric Lemaire	612.43268X00	7171

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ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-3873

EXAMINER

LEUNG, RICHARD L

ART UNIT PAPER NUMBER

3744

DATE MAILED: 07/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

SP

Office Action Summary	Application No. 10/726,506	Applicant(s) LEMAIRE ET AL.	
	Examiner Richard L. Leung	Art Unit 3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>04-26-05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the steps of feeding the gas phase into the top of the distillation column separately from the liquid phase, as recited in claims 7 and 10, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

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Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0104438 A1 (Cadours et al.) in view of US 2002/0062735 A1 (Lecomte et al.).

Cadours et al. disclose a method for treating natural gas containing hydrocarbons and hydrogen sulfide (H₂S) comprising contacting the gas with a first physical solvent in a primary absorption section 2 so as to obtain a liquid effluent through line 7 and a treated gas depleted in hydrogen sulfide through line 3. See paragraph [0044]. The liquid effluent is expanded in a flash drum 10 to form a hydrocarbon depleted liquid effluent and a gaseous effluent containing hydrocarbons which is subsequently contacted with a second physical solvent in column 12 so as to obtain a liquid effluent containing hydrogen sulfide discharged through line 14, and a fuel containing hydrocarbons through line 13. See paragraph [0048]. The physical solvents can have a temperature between 20 degrees C and 70 degrees C. See paragraph [0046]. The liquid effluent from line 14 is then heated in heat exchanger 30 and fed to a distillation column 18 so as to obtain a regenerated solvent at the bottom of the column 18. See paragraph [0050]. Cadours et al. further disclose that the first physical solvent is an aqueous solvent having a water content below 50% by weight. See paragraph [0039]. Cadours et al. fail to disclose that the natural gas is first cooled so as to condense water and to

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recover a gaseous effluent, which is then distilled to obtain a liquid phase and a gas phase, said gas phase being cooled so as to obtain a condensate and a gaseous effluent depleted in hydrogen sulfide and in water. Cadours et al. further fail to disclose that the gaseous effluent depleted in hydrogen sulfide and in water is maintained at a temperature ranging from -100 degrees C to 30 degrees C and at a pressure above 1 MPa abs. Lecomte et al. teach a method for pretreating acidic natural gas containing hydrogen sulfide comprising the steps of cooling the natural gas in heat exchanger 102 so as to condense water and to recover a gaseous effluent. See paragraph [0054]. The gaseous effluent is distilled in column 14 obtaining a liquid phase and a gas phase. See paragraph [0055]. The gas phase is then cooled by heat exchangers 16, 18, and 19 to obtain a condensate and a gaseous effluent depleted in hydrogen sulfide and in water, the gaseous effluent being at a temperature between -100 degrees C and 30 degrees C and at a pressure above 1 MPa abs. See paragraphs [0057] and [0058]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modified the process disclosed by Cadours et al. to include the method of pretreating acidic natural gas taught by Lecomte et al. because the pretreating method explicitly eliminates water and some of the acidic hydrogen sulfide from the natural gas, which are both undesired impurities.

4. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over 2002/0104438 A1 (Cadours et al.) in view of US 2002/0062735 A1 (Lecomte et al.). as applied to claims 1-5 above, and further in view of US 2002/0059865 A1 (Lemaire et al.). As discussed above, the combination of Cadours et al. and Lecomte et al.

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demonstrate all the limitations of the claims, except for expressly heating at least one of the liquid effluents so as to obtain a mixed effluent containing a liquid phase and a gas phase prior to distilling the liquid effluent in the distillation column to obtain the regenerated solvent, or that the gas phase from the mixed effluent is fed into the top of the distillation column separately from the liquid phase. Lemaire et al. teach a similar method for treating an acidic gas comprising the steps of heating the effluent from a column C10 in a heat exchanger E1, separating the heated effluent into gas and liquid phases in separating drum B10, and feeding the gas and liquid phases separately into distillation column D1 for the purpose of regenerating solvents in the effluent. See paragraphs [0061] and [0062] and Figure 2. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the combination of Cadours et al. and Lecomte et al. to have heated the liquid effluent (i.e. the effluent from line 14 of Cadours et al.) to obtain a liquid phase and gas phase prior to distilling the liquid effluent and to have fed the phases separately to the distillation column as taught by Lemaire et al. because such steps would allow for the different components in the effluent to be pre-separated and increase the effectiveness of the regeneration process. For example, the process of heating and separating the effluent could be implemented on line 17 of Cadours et al. such that heat exchanger E1 of Lemaire et al. is used in place of or in addition to heat exchanger 30, followed by the separating drum B10 and separate paths leading to the regeneration column.

5. Claims 1-3, 8, 9, and 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6102987 (Gross et al.) in view of US 2002/0062735 A1 (Lecomte

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et al.). Gross et al. disclose a process for treating a natural gas containing hydrocarbons, hydrogen sulfide and water comprising contacting the gas to be treated with a physical solvent in an absorber 2 so as to obtain a liquid effluent in stream 8 and a treated gas 7 depleted in hydrogen sulfide. See column 4, line 38 to column 5, line 11. Gross et al. expressly disclose that the absorption with said physical solvent occurs at a temperature between -20 degrees C to 40 degrees C, preferably -15 degrees C to 30 degrees C, and at a pressure as low as 10 bar (= 1 MPa). Gross et al. further disclose that said physical solvent could comprise water at below 50% by weight. See column 4, lines 38-58. The effluent stream 8 is subsequently heated in heat exchangers 9-11 so as to obtain a mixed effluent containing liquid and gas phases at vessel 12 prior to being fed to column 18, considered equivalent to a distillation column, where a regenerated solvent 24 is obtained. Gross et al. fail to disclose that the natural gas is first cooled so as to condense water and to recover a gaseous effluent, which is then distilled to obtain a liquid phase and a gas phase, said gas phase being cooled so as to obtain a condensate and a gaseous effluent depleted in hydrogen sulfide and in water. Gross et al. further fail to disclose that the gaseous effluent depleted in hydrogen sulfide and in water is maintained at a temperature ranging from -100 degrees C to 30 degrees C and at a pressure above 1 MPa abs. Lecomte et al. teach a method for pretreating acidic natural gas containing hydrogen sulfide comprising the steps of cooling the natural gas in heat exchanger 102 so as to condense water and to recover a gaseous effluent. See paragraph [0054]. The gaseous effluent is distilled in column 14 obtaining a liquid phase and a gas phase. See paragraph [0055]. The gas phase is

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then cooled by heat exchangers 16, 18, and 19 to obtain a condensate and a gaseous effluent depleted in hydrogen sulfide and in water, the gaseous effluent being at a temperature between -100 degrees C and 30 degrees C and at a pressure above 1 MPa abs. See paragraphs [0057] and [0058]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modified the process disclosed by Gross et al. to include the method of pretreating acidic natural gas taught by Lecomte et al. because the pretreating method explicitly eliminates water and some of the acidic hydrogen sulfide from the natural gas, which are both undesired impurities.

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6102987 (Gross et al.) in view of US 2002/0062735 A1 (Lecomte et al.) as applied to claim 9 above, and further in view of US 2002/0059865 A1 (Lemaire et al.). As discussed above, the combination of Gross et al. and Lecomte et al. demonstrate all the limitations of the claim, except for feeding the gas phase obtained by heating the liquid effluent into the top of the distillation column separately from the liquid phase. Lemaire et al. teach a similar method for treating an acidic gas comprising the steps of heating the effluent from a column C10 in a heat exchanger E1, separating the heated effluent into gas and liquid phases in separating drum B10, and feeding the gas and liquid phases separately into distillation column D1 for the purpose of regenerating solvents in the effluent. See paragraphs [0061] and [0062] and Figure 2. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have fed said liquid and gas phases into the column in the combination of Gross et al. and Lecomte et al. in the manner taught by Lemaire et al. because doing so could increase

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the amount of solvent that is regenerated. To elaborate, Gross et al. disclose separating the obtained gas and liquid phases in vessel 12 with only the liquid phase in stream 17 being fed to column 18. Therefore, by feeding the gas phase into the column as well, as is taught by Lemaire et al., it would be possible to recover any solvent in said gas phase.

Response to Arguments

7. Applicants' arguments, filed 26 April 2005, with respect to the rejection of claim 7 under 35 U.S.C. 112, first paragraph, have been fully considered and are persuasive. This rejection of claim 7 has been withdrawn.

8. Applicants' arguments, filed 26 April 2005, with respect to the rejections of claims 5 and 6 under 35 U.S.C. 112, second paragraph, have been fully considered and are persuasive in view of the amendment to claim 5. These rejections of claims 5 and 6 have been withdrawn.

9. Applicants' arguments, filed 26 April 2005, with respect to the rejections of claims 1-7 under 35 U.S.C. 103(a), have been fully considered but they are not persuasive. Applicants assert that the newly added limitation to claim 1, such that said first physical solvent is at a temperature range between -40 degrees C and 20 degrees C, is not demonstrated in the process disclosed by Cadours et al. However, Cadours et al. expressly indicates that the temperature range for the physical solvent is in the range between 20 degrees C and 70 degrees C in paragraph [0046]. Accordingly, because the range disclosed by Cadours et al. touches the claimed range at 20 degrees C, the reference is still considered sufficient to meet the added limitation.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard L. Leung whose telephone number is 571-272-4811. The examiner can normally be reached on Mon-Fri.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl J. Tyler can be reached on 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Richard L. Leung
Examiner
Art Unit 3744

rl


CHERYL TYLER
SUPERVISORY PATENT EXAMINER